

REMARKS

In accordance with the foregoing, claims 1 and 4 are amended and new claims 41-43 are added, claim 41 being independent and claims 42 and 43 depending from claim 41. No new matter is presented in the foregoing amended claims 1 and 4 and, accordingly, approval and entry of same are respectfully requested.

STATUS OF CLAIMS

Claims 1-19 and 41-43 are currently pending herein and are subject to reconsideration.

Claims 1-11, 13-19 are rejected.

Claim 12 is objected to and claims 1-11 and 13-19 are rejected.

**PAGE 2 OF THE ACTION: REJECTION OF CLAIMS 1-5, 8-11 AND 13-19 FOR
OBVIOUSNESS UNDER 35 U.S.C. 103 (a) OVER HORITA ET AL. (USP 6034422) IN VIEW
OF KAMADA (USP 4518449)**

The rejection is respectfully traversed.

APPARENT DEFECT OF THIS REJECTION

Whereas the heading at page 2 of the Action cites the combination of Horita et al. in view of Kamata, the body of the rejection on page 2 at lines 3, 4, and 5 from the end, instead cites Adler.

The sentence spanning pages 2-3 does refer to modifying Horita "based on teachings of Kamata in order to improve the adhesion to the copper layer..." but those "teachings of Kamata" are not addressed. Clarification of the rejection is respectfully requested.

In an effort to advance prosecution, Applicants address both Adler and Kamata in the following - - and neither is supportive of the combination with Horita et al. for the rejection of the pending claims.

The primary reference to Horita et al. is cited for teaching a conductor substrate for mounting a semiconductor element wherein a portion of the semiconductor element used for mounting the semiconductor element is sealed with an insulating resin - - and wherein the upper most surface layer of the semiconductor substrate comprises copper or an alloy thereof and the copper substrate is partially or entirely covered with a layer of copper oxide. The Action however, concedes that Horita:

...does not teach that the copper oxide contains a hydroxide formed upon surface treatment of said conductor substrate.

ADLER

At page 2, five lines from the end, the Action cites "Adler" as teaching "a copper oxide layer containing an hydroxide formed upon surface treatment of a conductor substrate.

However, as addressed at page 6 of the preceding response, Adler (USP '722) teaches only treating a copper foil with "black oxide" to produce whiskers of copper oxide which contain copper hydroxide. Further, as was pointed out in the last three lines on page 6 of that prior response:

However, since copper hydroxide adversely affects the formation of whiskers, the copper hydroxide is removed by a subsequent reduction step.

Hence, the copper hydroxide of Adler is irrelevant to the present invention. Pages 7-8 of the prior response further traverse the rejections of the first Office Action of claims 6 and 7 over Horita et al. and Adler in view of Nagai et al, and the same are incorporated by reference herein.

The current Action is silent with regard to those traverses of the prior response over the combination of Horita et al., Adler and Nagai - - but if the present Action does intend to rely on that combination, it is requested that the Examiner issue a replacement Office Action addressing the traverse of the prior response and as well the current traverse of that combination.

KAMADA

Although it is not apparent, the Examiner may have intended to rely on Kamada, but that as well seems unlikely - - as discussed below, Kamada is inconsistent with both Horita et al. and the claimed invention herein.

More particularly, the Examiner asserts that Kamada renders obvious the use of a copper film containing a hydroxide, and argues that it would have been obvious to modify the primary reference to Horita by the teaching of Kamada "to improve the adhesion to the copper layer." These contentions are contrary to the disclosure of Kamada.

Kamada teaches that, in conventional production, if an oxide layer is used, good adhesion can be achieved, but frequency response is degraded. See column 1, lines 25-33 and lines 45-52. On the other hand, if a copper hydroxide film is used, good frequency response is achieved, but there are problems with adhesion. See column 2, lines 43-55. Kamada then attempts to achieve both good adhesion and good frequency response through the use of the

process described at column 2, lines 7-28 of the reference ("the Kamada process"). However, if a hydroxide is used without the Kamada process, adhesion remains bad. Further, based on col. 2, lines 45-52, the Kamada process seems furthermore to require the use of "oxygen-free copper." These factors dictate against any likelihood the Examiner intended to rely on Kamada - - rather than Adler - - in combination with Horita.

As mentioned above, whereas the Examiner asserts that it would have been obvious to use hydroxide "to improve the adhesion to the copper layer" (Action at page 3, line 1). Kamada teaches quite the opposite. Moreover, if a hydroxide is used without the Kamada process, then adhesion is bad.

Thus, Kamada requires the Kamada process in order to use a hydroxide. However, the Kamada process is inconsistent with the claimed invention herein and also with the teachings of the primary reference to Horita.

The only motivation that Kamada teaches for using a hydroxide is to provide improved high frequency response. However, the goal of improved high frequency response is incompatible with the objective of the claimed invention of improving adhesion and with the teachings of the primary reference to Horita et al.

PAGE 5 OF THE ACTION: REJECTION OF CLAIMS 6 AND 7 UNDER 35 U.S.C. 103 (a) FOR OBVIOUSNESS, OVER THE PRIMARY COMBINATION OF HORITA ET AL. AND KAMADA TAKEN FURTHER IN VIEW OF NAGAI ET AL.

The rejection is respectfully traversed. It is submitted that the combination of Kamada and Horita et al. is defective for the reasons discussed above with regard to the confusion of whether "Adler" was instead intended and for the further reasons that Kamada clearly is incompatible with Horita et al. and as well with the claimed invention. These deficiencies are not overcome by reliance on Nagai. Moreover, Nagai is addressed and the reliance thereon is traversed at pages 8-9 of the prior response; the present Action fails to address that traverse and which is incorporated herein by reference. Should the examiner intend to rely on this ground of rejection, it is requested that the Examiner address the traverse of the prior response in a replacement Office Action.

LACK OF *PRIMA FACIE* DEMONSTRATION OF OBVIOUSNESS OF THE COMBINATIONS RELIED UPON

It is submitted that the Action fails to satisfy the requirement of a *prima facie* demonstration of obviousness of the combination(s) advanced in the Action and, instead, relies on the discredited bare contention that the combination(s) "would have been obvious to one of ordinary skill in the art...." Moreover, motivation to effect the combinations is not supported by the Examiner's suggestions. See MPEP 706.02(j), which emphasizes that the Examiner should set forth in the Office Action: (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate, (B) the difference or differences in the claim over the applied reference(s), (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and (D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See **MPEP § 2143 - § 2143.03** for decisions pertinent to each of these criteria.

CONCLUSION

It is respectfully submitted that the foregoing demonstrates that the rejected claims 1-19 clearly, patentably distinguish over the art and rejections of record and are in condition for allowance. There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.


Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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